

**FUZZY GENETIC LEARNING AUTOMATA CLASSIFIER****ABSTRACT OF THE DISCLOSURE**

A method is provided for deriving a near-optimal fuzzy automaton for a given separation problem. The method includes the steps of: forming a first generation population (24) of fuzzy automata, where the first generation population of fuzzy automata includes a plurality of fuzzy automata; performing a mutation operation (28) on each fuzzy automaton in the first generation population of fuzzy automata; reproducing the first generation population of fuzzy automata using a survival of the fittest operation (30, 32, 34); and applying a cross-over operator (36) to the reproduced first generation population of fuzzy automata, thereby yielding a next-generation population of fuzzy automata. A near-optimal fuzzy automaton is identified by evaluating the performance (38) of each fuzzy automaton in the next-generation population; otherwise the methodology is repeated until a near-optimal fuzzy automaton is derived for the given separation problem.

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